The Textile Museum Journal 1986

The Textile Museum Journal 1986
AND
The Textile Museum Annual Report, 1986

Volume 25

The Textile Museum
Washington, D.C. 1987

The Journal was edited by
Dolores E. Fairbanks and Ann P. Rowe

Copy editor: Judith Millon
Designer: Polly Sexton
Printer: Schneidereith and Sons

Published annually, Copyright ©1987 by
The Textile Museum ISSN 0083-7407

Cover:
Qanat panel
See Ellen S. Smart, "A Preliminary Report on a Group of Important Mughal Textiles," cat. no. 2

Color reproduction in this issue of *The Textile Museum Journal* has been made possible by the generous assistance of Dr. Alvin O. Bellak. The Textile Museum invites such contributions to enhance future issues of the journal.

Note to Contributors:
In 1962 The Museum initiated *The Textile Museum Journal* to foster research and publication on the history of textile arts. Emphasis is placed primarily upon research relating to textiles from the geographic areas represented in the museum's collections: the Near East, Central, South and Southeast Asia, and South and Central America. The journal provides a forum for original research on the artistic and technical aspects of textiles in their historic and cultural contexts.
The Textile Museum Journal invites submission of original articles that fall within its aims and scope. Manuscripts should be twenty to forty-five double-spaced typed pages and be accompanied by an abstract and cover sheet with title and short autobiographical statement. Authors must follow the most recent edition of *Chicago Manual of Style* (currently 13th ed.). Authors may submit no more than twenty good-quality 4 x 5 or 8 x 10 black-and-white glossy photographs, including camera-ready artwork. All illustrative material must be accompanied by a separately typed sheet of figure captions.
For further information, write to the Coordinator of Publications, *The Textile Museum Journal*, 2320 S St. NW, Washington, DC 20008

Contents

5 A Preliminary Report on a Group of Important Mughal Textiles
Ellen S. Smart

25 The Carpet-Makers of Western Anatolia, 1750-1914
Donald Quataert

33 A Tapestry Roundel with Nilotic Scenes
Laila Abdel-Malek

47 A Braiding Technique Documented in an Early Nineteenth-Century Japanese Treatise, "Soshun Bikō"
Masako Kinoshita

67 Nasca Sprang Tassels: Structure, Technique, and Order
Mary Frame

83 Commercial Materials in Modern Navajo Rugs
Ann Lane Hedlund

95 The Textile Museum Annual Report, 1986

A Braiding Technique Documented in an Early Nineteenth-Century Japanese Treatise "Soshun Bikō"

Masako Kinoshita

Professional braiders in Japan have produced highly developed braids, most often made of silk, of complex structures and excellent craftsmanship. Comparing the qualities of extant braids from the eighth century[1] and those made by the contemporary Japanese hand-braiding technique known as *kumihimo*,[2,3] the consensus of most Japanese braiders and textile scholars is that a stand and bobbins, such as used in *kumihimo* today, must have been devised in the early stages of the development of Japanese braiding techniques. The stand supports the component strands and the bobbins, on each of which an individual strand is wound. These bobbins act as weights for the strands during the braiding process. Since stands and bobbins used in contemporary *kumihimo* could have been made by the woodworking technology known in the eighth century, it is not difficult to accept the hypothesis that similar means were used from very early times. No scholarly research to support this hypothesis has yet been reported.[4] That these braids might have been made by any other method has never been presented.

In 1978, after learning a braiding technique of Danish origin, *slentre*, I spent some time comparing the structural characteristics and production efficiency of *kumihimo* and *slentre*.[5] In *slentre* the working ends of paired braiding strands are formed into loops. Each loop is hooked by a fingertip to keep the strands taut and in an appropriate order while the looped ends are manipulated to construct a braid (finger-held loop-manipulation). I soon began to realize that a considerable number and variety, if not all, of the ancient braids in Japan might have been constructed by a method similar to that of *slentre*. The data from the extant braids indicate, however, that any such technique for the Japanese braids required the handling of more than eight loops, the limit in the case of finger-held loop-manipulation technique.

Loop-manipulation braiding techniques outside of Japan have been documented over the years.[6] The extent of their technical and structural diversity is considerable and the geographic distribution around the world is extensive. It would not be far-fetched, therefore, for me to postulate the existence of the loop-manipulation technique in Japan.

In my search for documented evidence, I came across several old Japanese paintings and drawings showing braiders,[7] some depicting methods most likely to be finger-held loop-manipulation techniques (Fig. 1).[8] One of them dates as far back as the fifteenth century. These prove that my hypothesis—the early existence of loop-manipulation techniques in Japan—has not been groundless.

These illustrations have been noted by braiders and scholars of Japanese textiles. They have never been studied critically, however, and the depicted braiding methods have merely been regarded as unattributable lost arts that predate the stand-and-bobbin technique.[9]

As for written materials, several records of the Mano family from the late eighteenth to early nineteenth centuries are cited by Dōmyō as containing obsolete hand-braiding techniques.[10] A partial manuscript copy owned by Dōmyō Braiding Co. describes a braiding procedure in which the looped ends of strands are held around each hand and manipulated (hand-held loop-manipulation braiding).[11] In the hand-held loop-manipulation the number of loops can be larger than eight.

The most important documentary evidence is, however, found in the treatise "Soshun Bikō" (Notes on Braiding, three chapters), originally included in an unpublished manuscript "Shika Sūyō" (The Thesaurus for Ceasing War) written about 1810 (Fig. 2).[12] It discusses both stand-and-bobbin braiding and hand-held loop-manipulation braiding, as well as techniques of processing silk for braiding.

Fig. 1. Braider and embroiderer from Shichijūichiban Shokunin Utaawase *(Poetry Match: Seventy-One Pairs of Artisans). The accompanying poem for the braider at upper left reads "Woodpecker [design], nobody wears lately—oh! weary." A copy of the fifteenth-century drawing, made in 1675 by Hakuseki Arai (1657–1725). Courtesy of Archives and Mausolea Division, Imperial Household Agency*

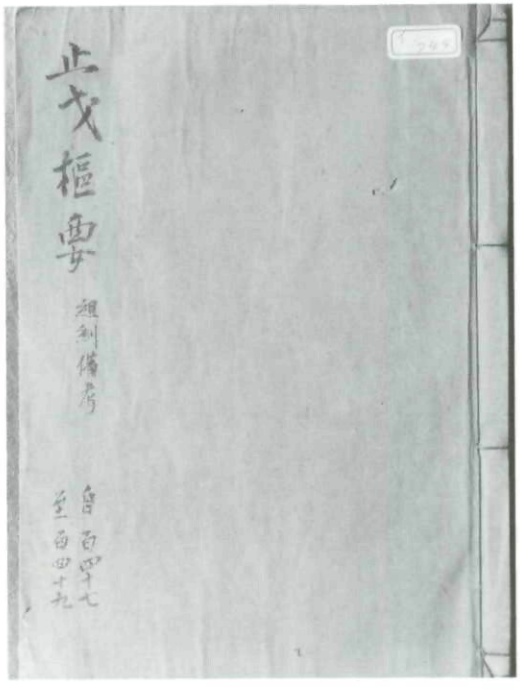


Fig. 2. Cover of the original "Soshun Bikō," chapters 142–144 of Shika Sūyō, *ca. 1810. The chapter numbers on the cover are incorrectly written and read chapters 147–149. Courtesy of Kurobane-chō, Tochigi-ken, Japan*

The existence of "Soshun Bikō" has been known to braiders and Japanese textile scholars through an annotated edition published by Seiken Shimotori after his extensive bibliographical research.[13] The actual technique of the loop-manipulation, however, has not been revived thus far due to the nature of the text. Most likely for protection of the trade secret, that is, the loop-manipulation technique, the text contains cryptographic expressions and omits key information, which make it difficult to comprehend.

This paper presents a result of my research in which the hand-held loop-manipulation braiding technique described in "Soshun Bikō" was reconstructed by analytical as well as experimental methods. This provides material proof of the historical significance of the technique and restores a hitherto lost skill.

Let me summarize the main features of the hand-held loop-manipulation braiding technique from "Soshun Bikō." An end of bunched strands is fixed to a post. All strands at the opposite manipulating end are looped; a loop may be formed by returning a continuous strand of yarn while strands are being prepared, by knotting the two ends of strands, or by linking two loops. Loops are slipped on and held around each hand. The tension of the strands is adjusted by the pulling force of the braider's working hands through the loops. Loops are transferred from hand to hand by passing them around the outside (outside-around manipulation) or by penetrating them through the inside (inside-through manipulation) of the rest of the loops. In each manipulation of a loop, the upper and lower shanks of the loop simultaneously but separately create structures in two levels as they interwork with the strands in other loops. When both the "outside-around" and "inside-through" manipulations are performed, the braided structure is constructed at four levels. Although braiding by this method limits structural diversity, the construction in four levels is a feature unique to the hand-held loop-manipulation technique. In free-end manipulation, on the other hand, each strand moves individually; all possible obliquely interworked structures can be produced.[14] But even *kumihimo,* one of the most efficient free-end braiding techniques, does not feature construction of four-level structures. Whereas in free-end manipulation, structural uniformity has to be maintained by controlling the strands individually, in loop-manipulation techniques it comes naturally from a consistent take-up of the strands as a whole. The symmetric manipulation of paired strands results in high production efficiency. The technique, therefore, is suited

Fig. 3. Lord of Kurobane, Masunari Ōzeki (1782–1845), the author of "Shika Sūyō." Painter: Unknown. Courtesy of Kazuo Ōzeki

to the production of braids in quantities requisite for functional purposes. In Japan, the major use from the eleventh to nineteenth centuries was for armor lacing.

The author of "Shika Sūyō," Masunari Ōzeki (1782–1845), was the lord of the fief of Kurobane (Kurobane-chō, Nasu-gun, Tochigi-ken, Japan) (Fig. 3). Ōzeki lived in the late Edo period (1603–1867), when Japan had had no major civil disturbances for two hundred years. While there were economic and social problems, the Tokugawa Shogunate controlled all of Japan under a well-established feudal system. To meet the heavy burden of taxes imposed on fiefs by the central government, and also to maintain stability in people's lives, it was imperative for the lords of the fiefs to find and promote advantageous revenue sources. Ōzeki promoted sericulture, textile, and ceramic manufacturing for which the region had been, and still is, renowned. He was a conscientious and practical head of a fief.

"Soshun Bikō" is one of the eight parts of "Shika Sūyō" dealing with military affairs and strategies.[15] Ōzeki himself considered "Shika Sūyō" the most important of his entire works. By choosing a combination of the characters *shi* (stop) and *ka* (spear) for the title, he reflects the ancient Chinese philosophy, which he shared, that the purpose of the military is to prevent fighting by stopping the use of arms.[16] Among other military-related matters, Ōzeki describes the technologies needed for the production of arms and armor. "Soshun Bikō" is one of three parts in "Shika Sūyō" specifically dealing with the textiles and related subjects that are used extensively in the making of swords and armor. The other two parts are "Kishoku Ihen" (A Collection of Looming Arts, 15 chapters) and "Saishiki Ruijū" (Classified Collection of Coloring Arts, two chapters).

There are two versions of "Shika Sūyō."[17] One is a collection of source material (176 chapters) and was never intended for publication. The other is an edited and expanded version of the source material (353 chapters, 1814–1822), which was also not published.[18] Only the original set of manuscripts and several sets of incomplete manuscript copies remain today. The hand-held loop manipulation technique, referred to as "the Confidential Braiding Technique," is found only in the 176-chapter version, not in the later 353-chapter version.

Ōzeki later published a five-chapter abridged monograph, titled *Kishoku Ihen* (1830), which contains "Kishoku Ihen" as chapters 1 through 3, and "Soshun Bikō" and "Saishiki Ruij" as chapters 4 and 5, respectively.[19] In this abridged version, however, only several lines were allotted to the loop-manipulation method referred to as "the No-stand Hand Braiding Method." The details of the loop-manipulation method and the third chapter, "The Most Confidential Orally Transmitted Braiding Technique" of the original "Soshun Bikō," were omitted entirely. It could well be that Ōzeki wished to protect the trade secrets of the braiders in his fief from competitors. The subject of this paper, hand-held loop-manipulation braiding, is found only in the second and third chapters of the treatise "Soshun Bikō," chapters 143 and 144 of the 176-chapter version of "Shika Sūyō."

My research and the translation that follows are based on "Soshun Bikō,"

Fig. 4. Back plate of a Japanese armor, 16th century. Odoshige, *lacing braids for the lamellae of bodice and skirt of cuirass, and* hishinui, *cross-stitching at the hem, are flat braids of solid color.* Uname, *a row of straight stitching above* hishinui, *is a flat braid of* takuboku *design.* Agemaki *is a cord bow of a round braid with tassels that hang from a gilt ring attached in the center back.* Takahimo, *shoulder straps, are of leather cord. Genji braid of* Taka no Ha *(falcon feather) design are often used instead of leather cord. Courtesy of the Metropolitan Museum of Art, Rogers Fund, 1904 (04.4.2)*

which is now volume five of the six-volume monograph *Shika Sūyō Shō,* edited and published by Seiken Shimotori, Tokyo, 1941.[20] In this annotated edition, the chapters dealing specifically with textile and leather crafts in the 176-chapter version of "Shika Sūyō" were selected.

Since early times in Japan, braids have been used extensively for functional as well as decorative purposes. Numerous braids, some from the seventh century, survive as parts of treasures in shrines and temples, attesting to the unbroken tradition of the use of braids in Japanese culture. Braids with a round cross section have been attached to decorate and hang musical instruments, amulets, and mirrors. Exquisite thin, flat braids have been wound around the illuminated sutra scrolls dedicated to the Itsukushima Shrine in A.D. 1126 by members of the Taira clan. A flat braid would also have been used for wrapping a sword hilt, whereas a heavier, double-faced flat braid would have been used for wearing a pair of swords. A square braid attached to a helmet was tied under the chin to secure it on the head. Each type of braid was selected to serve a specific purpose as well as to satisfy the aesthetic needs of the user.

It is on armor and its accessories, however, that braids have been used most abundantly. Japanese armor is of the lamellar type, in which small leaves (lamellae) of lacquered rawhide are laced together with silk braids (Fig. 4).[21] Brave fighters and members of the great warring clans of the middle ages are remembered in epics by the color of their armor: Yoshitsune, the grand general of the Minamoto clan, wore armor laced all in scarlet, while Atsumori, the sixteen-year-old son of the Taira clan, was clad in armor laced with braid of spring green graduated from dark to light.

A typical suit of armor requires about two hundred pieces of 2.5-meter-long lacing braid *(odoshige).* A common lacing braid is a single-layer braid of a twill structure with eight ridges[22] consisting of fourteen to thirty-four strands, and usually of a solid color.[23] In addition to the lacing braids, nearly eighty more braids of various weights, structures, lengths, widths, and color designs are needed to complete a suit.

Since braids for armor had to be constantly replenished and repaired, the demand must have been staggering when warring clans struggled for power in the five centuries preceding the Edo period.[24] To fill this demand, braids had to be made with skill and efficiency. The *kumihimo* technique employing the high stand *(takadai)*[25] is efficient, but this technique is generally considered not to have originated before the Edo period.[26] The *kumihimo* technique using a circular-top stand *(marudai),* is not an appropriate tool for producing lacing braids.[27] It is neither indicated in "Soshun Bikō" nor used in contemporary Japan as a device for such braids. On the other hand, as is pointed out in subsection [1] "The Confidential Braiding Technique" in "Soshun Bikō," the loop-manipulation braiding technique would produce, in the same amount of time, a braid approximately three times as long as a braid made by *takadai.* Therefore, it appears that loop-manipulation is the most plausible technique for meeting the demand in the era prior to the nineteenth century.

This article deals only with the portion of the second chapter of "Soshun

Bikō" (chapter 143 of "Shika Sūyō") that contains instructions for the hand-held loop-manipulation braiding technique. The rest of "Soshun Bikō" is excluded. Among the excluded portions are details on the loop-manipulation braiding in the third chapter that are not essential for understanding this technique. Results of my studies on the analysis of structure and color designs are planned for future publication.

In the following section, Annotated Translation of this second chapter of "Soshun Bikō" (Notes on Braiding), my interpretation and explanatory remarks follow each translated subsection. At the end of the paper I present a commentary and a conclusion.

The cryptographic description of the "Confidential Braiding Technique" in the original is retained in the translation. The ambiguities intrinsic to the Japanese language and those that have been caused by insufficient wording are also retained as much as possible in the translated text. I have inserted those terms necessary to construct a meaningful sentence in brackets. Equivalents for the technical terms have been added, also in brackets, to aid the reader (for example, translations of braid names). My initials, MK, precede my interpretations and explanatory remarks. Notes by the author, Ōzeki, appear in italics.

An Annotated Translation of Chapter 2 of "Soshun Bikō"
(The Thesaurus for Ceasing War, chapter 143)

"Notes on Braiding," Chapter 2—Table of Contents[28]

[1] [Summary of] the Confidential Braiding Technique
[2] Diagram of the Manner of Holding Strands [loops] around the Hands (Fig. 14)
[3] Allotment of the Strands [loops] around the Hands
[4] Mode of Manipulation of Strands [Braid no. 1] (Figs. 5, 6)
[5] Genji Braid [Braid no. 2] (Fig. 7)
[6] Pseudo-Genji Braid [Braid no. 3] (Fig. 8)
[7] Double-Square Braid [Braid no. 4] (Fig. 9)
[8] Square Braid [Braid nos. 5A, 5B, 5C] (Figs. 10, 11, and 12)
[9] Braiding Procedure [Braid no. 6] (Fig. 13)
[10] Take-Up of Yarn
[11] Examples of Color Arrangement
[12] Diagrams and Specifications for a Hand-braiding Stand (Figs. 15A, 15B, and 15C)
[13] Diagrams and Specifications for Hand Straps (Fig. 16)
[14] List of the Orally Transmitted Confidential Braiding Technique

[MK] In the original, the Table of Contents subsection headings do not necessarily agree with the wording in the text, as you will see beginning with subsection [2]. Subsections [4–9] are instructions for making structurally distinct braids. [Four], Mode of Manipulation of Strands, and [9], Braiding Procedure, are misleading headings as each also provides instructions for a distinctive braiding structure.

"Notes on Braiding," Chapter 2

[1] [Summary of] the Confidential Braiding Technique

To braid by a stand[-and-bobbin] method involves various procedures and is troublesome. Instead, with this method, without using a stand or bobbin, the strands are slipped on around one's left and right hands and kept taut. Since the hands do not touch the yarn, it will retain its lustre.[29] Moreover, if this method is compared with the stand method, in the time a 6-*shaku* 5-*sun* [2.5 meters] braid is fashioned on a stand, a braid of 1-*jo* 9-*shaku* 5-*sun* [7.4 meters] can be made.[30] Because of this convenience and simplicity, it has been designated as a confidential technique. With this braiding method, altogether seven kinds—*odoshige* [lacing braid], *ryōmen kikkōgumi* [reversible tortoise-shell braid],[31] *takubokuuchi* [woodpecker braid],[32] *shikakuuchi* [square braid], *anaaki shikakuuchi* [tubular? square braid],[33] *genjiuchi* [genji braid] and *nise genjiuchi* [pseudo-genji braid] can be made.[34] Keep it confidential. Keep it confidential.

[MK] The finished length, 6-*shaku* 5-*sun* [2.5 meters] of a braid quoted often in the text is the standard length used for lacing and decorating Japanese armor.

[2] Diagram of the Manner of Holding the Twenty-Six Strands in the Left and Right Hands (Fig. 14)

[3] Allotment of Strands [Loops] around the Hands

[MK] The following numeration follows Western tradition.

1. 15 pairs [of strands]: *for upper and lower strands total 30 strands;* 7 pairs on the right hand and 8 pairs on the left.
2. 17 pairs: *for upper and lower strands total 34 strands;* 7 pairs on the right hand, 10 pairs on the left.
3. 16 pairs: *for upper and lower* [strands] *total 32 strands; this is for genji braids.* 8 pairs on the right hand and 8 pairs on the left [See [5] Genji Braid].
4. 13 pairs: *for upper and lower* [strands] *total 26 strands.* 5 pairs on the right hand and 8 pairs on the left.

[MK] Although examples for the allotment with only 13, 15, 16, and 17 loops or pairs of strands, are listed here, [11] "Examples of Color Arrangements" and a diagram in chapter 3 include those with 7, 9, and 11 loops. For genji braids, the example given is only for 16 loops.

[4] Mode of Manipulation of Strands [Braid no. 1]

First [Mode A]: Move the loop on the outer heaven to the inner earth. *Beat with the beater by tugging* [the rope tied to] *your foot. It is important to execute a well-controlled beating. The degree of beating has to be adjusted according to the size of the strands.*

Second [Mode B]: Move the loop on the outer earth to the inner heaven. *Beat with the beater by tugging* [the rope tied to] *your foot.*

Third [Mode C]: Move the loop on the outer heaven from [the direction of] *tatsumi*[35] with a twist, and place it to the inner earth.[36] *Beat with the beater by tugging* [the rope tied to] *your foot.*

Fourth [Mode D]: Move the line on the outer earth from [the direction of] *tatsumi* to the inner heaven. *Beat with the beater by tugging* [the rope tied to] *your foot.*

Braid many times in this way. The modes are the same for *ryōmen* and *nise* [pseudo] *kikkōgumi, odoshige,* and *takuboku.* Complete the four modes and return to the beginning.

[MK] The words used to describe the procedures are difficult to comprehend. I do not think it is because idiomatic changes took place between the nineteenth century and the present; rather, ambiguity might have been introduced intentionally to protect trade secrets. Other possible reasons for the ambiguity are that the text was written as a "note," not as a full document, and that the "brief form" was familiar to the initiates, as is often the case with confidential records of various disciplines. This reasoning, however, does not explain the marked departure of this section from the style and content of other passages that give detailed and specific descriptions.

My experimentation with the actual braiding procedure: To aid the reader, in the following paragraphs, my procedures are presented in italics, followed by the explanation of my interpretation of the original text, again preceded by my initials, MK.

Braiding starts by picking up a loop from the left hand and transferring it to the right hand; a loop on the right hand is then picked up and transferred to the left hand. Every time a loop is transferred the strands interwork, and the formed web must be tightened by the action of the beater.

The described four modes are the steps of braiding manipulation repeated to produce braid no. 1 (Fig. 5). The procedure produces a single-layer braid of a twill structure with eight ridges. Four kinds of braids, *ryōmen kikkō, nise kikkō, odoshige,* and *takuboku,* can be made in the same structure by repeating these four modes, using strands of different colors organized in various orders, and using a solid color for *odoshige.*

An odd number of loops is required. Example: 8 loops around the left hand and 5 around the right (Fig. 5).

[4] Mode of Manipulation of Strands (Braid no. 1):

Mode A: Pick up the outermost loop held around the left hand by the fingers of the right hand and place it to the left of the innermost loop on the right hand. The picked loop is

Figures 5 to 13 are diagrammatic drawings of the braids listed in the table of contents. The diagram for each braid shows: (at the top) the initial allotment of loops to each hand, (in the middle) its track-plan, the cross sectional view of the path on which component strands traverse, and (at the bottom) the outer faces of a representative braid. The circles with unprimed numbers represent the upper shanks of looped strands, and those with primed numbers the lower shanks. They are numbered consecutively from left to right for the loops held on the left hand, continuing to those held on the right hand, which are numbered from right to left. The numbers identify the location of the corresponding strands in the braid and those on the track-plan. In the diagrams, the apex of a braid (the end that is fastened to a post) is at the top. The braid grows toward the manipulating end at the bottom. In actual practice a braid is contructed in a horizontal position and grows toward the braider.

transferred around the outside of the rest of the loops on the left hand, that is, the upper shank of the loop passes over and the lower shank passes under the left hand. Beat on the juncture between the strands held by both hands.

Mode B: Pick up the outermost loop held around the right hand by the fingers of the left hand and place it to the right of the innermost loop on the left hand. The picked loop is transferred around the outside of the rest of the loops on the right hand. Beat.

Mode C: Using the fingers of the right hand inserted through the inside of the loops held around the left hand, pick up the outermost loop on the left hand, slip it out, twist a half turn so that the upper shank of the loop becomes the lower shank, and place it to the left of the innermost loop on the right hand. Beat.

Mode D: Using the fingers of the left hand inserted through the inside of the rest of the loops held around the right hand, pick up and then slip out the outermost loop on the right hand, and place it to the right of the innermost loop on the left hand. Beat.

Repeat the above four modes to form braid no. 1.

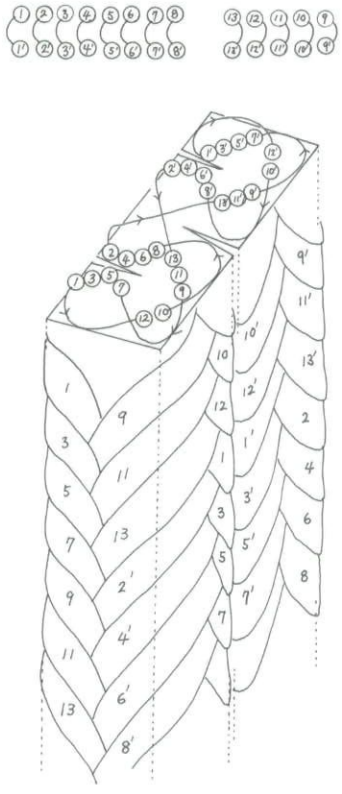


Fig. 5. Diagram of [4]. Braid no. 1, Ito no kumikata *(Mode of Manipulation of Strands). Example: 8 + 5 = 13 loops, 26 strands. This braid is formed in a tight accordion-fold, as shown in the diagram, and looks like a braid with a rectangular cross section while it is constructed*

Mode A in Japanese: *kengai no ito o konnai e kakeru.*
乾外ノ糸ヲ坤内へ掛ル。
Mode B in Japanese: *kongai no ito o kennai e kakeru.*
坤外ノ糸ヲ乾内へ掛ル。

Ken [**乾**] = dry, heaven, northwest.
Kon [**坤**] = moist, earth, southwest.[37]
[MK] *Ken* as meaning heaven and *kon* earth, customarily used as a combination *kenkon,* have been selected over other meanings because they convey symmetry of movement. It should be noted that "heaven" does not necessarily imply an upper position or right hand. In Sino-Japanese convention, the left side is considered to possess the dominant force. It is, therefore, customary to start an action from the left hand or leg in traditional Japanese performing arts, and to associate "heaven" with left and "earth" with right. Starting the action from the left hand, in our case lifting a loop on the left hand, does conform with construction of a braid with a better balance, since a loop is transferred from the more numerous to the lesser side.

Mode C in Japanese: *kengai no ito o tatsumi yori hineri tori te konnai ni kakeru.*
乾外ノ糸ヲ巽ヨリ捻リ取リテ坤内ニ掛ル。

Tatsumi [**巽**] = southeast.
[MK] *Tatsumi* was the most ambiguous word of the entire text. The word is used again in the next step, in which a loop is transferred in the opposite direction, right to left. Therefore, it cannot mean southeast direction relative to heaven or northwest *(ken)* and earth or southwest *(kon).* The solution cannot be deduced from any meaning of the word that I have been able to find. The unambiguous solution was reached by analyzing the construction principle of the loop-manipulation braiding process and with a clue derived from the procedure for the genji braid in the next section. The key lies in the movements that are described as "upper-side" and "inside." This should mean that a loop is transferred by passing around the outside or through the inside of the rest of the loops. Only when loops are transferred around the outside for the first and second modes, and through the inside for the third and

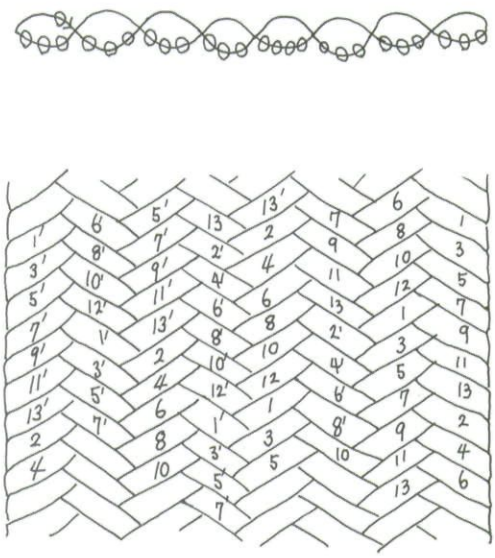


Fig. 6. Braid no. 1 unfolded, revealing a single-layer twill braid with eight ridges

fourth modes, is a structurally meaningful braid constructed by this process, "mode of manipulation of strands."

It does not matter, theoretically, in which direction the loop is twisted as long as it is done consistently for each mode. In practice, however, loops are twisted, for convenience, clockwise when transferred from the left hand to the right, counter-clockwise when transferred from the right to the left.

Mode D in Japanese: *kongai no ito o tatsumi yori tori te kennai ni kakeru.*
坤外ノ糸ヲ巽ヨリ取テ乾内ニ掛ル。

[MK] Once the third mode is understood, the fourth mode is self-explanatory. Notice that the loop is not twisted for this mode. These four modes are only half of the possible eight modes used in the hand-held loop-manipulation braiding technique, each mode being a combination of one from each of the three pairs of operations: (1) left to right and right to left, (2) "outside-around" and "inside-through," (3) with and without a twist. The four modes described in the subsection [4], coupled with a prescribed number of loops held in each hand, provide the instruction for a specific braid, braid no. 1.

[MK] The following subsection headings numbers 5 through 10 are taken directly from the Table of Contents as the original manuscript had no specific headings for these sections.

[5] For genji braid [Braid no. 2], pick and twist the upper-sides for both yin and yang, and the insides without a twist for both yin and yang.

[6] For pseudo-genji [Braid no. 3], pick and twist both the upper-sides and insides for yin and yang.

[7] Pick and twist both the insides for yin and yang, a double-square braid [Braid no. 4] forms.

[8] Pick the insides for yin and yang without a twist, two separate square braids form [Braid no. 5A].

[8] Pick and twist the outsides for yin and yang, a square braid forms [Braid no. 5B].

[8] Pick and twist the undersides [insides] for yin and yang, a square braid forms [Braid no. 5C].

[9] Pick only the outsides without a twist for yin and yang, a flat braid forms [Braid no. 6].

[10] The 9-*shaku* [3.41 meters] long strands complete a 6-*shaku* 5-*sun* long braid.

[5] Genji Braid [Braid no. 2] (Fig. 7)

Step 1: Pick up the outermost loop held around the left hand by the fingers of the right hand, transfer it around the outside of the rest of the loops on the left hand, twist the loop a half turn and lay it to the left of the innermost loop on the right hand.

Step 2: Same as above but from right to left.

Step 3: Pick up and then slip out the outermost loop held around the left hand by the fingers of the right hand inserted through the inside of the rest of the loops, and lay to the left of the innermost of the right hand.

Step 4: Same as above but from right to left. Beat between the steps. Repeat the steps.

16 loops, 8 loops in each hand, are required for a genji braid.

[MK] In this subsection four new terms, "yin," "yang," "uppersides" and "insides," which seem to imply four kinds of manipulations, are brought in without reference to the maneuvers that have been introduced.

"Yin" and "yang" are the words that

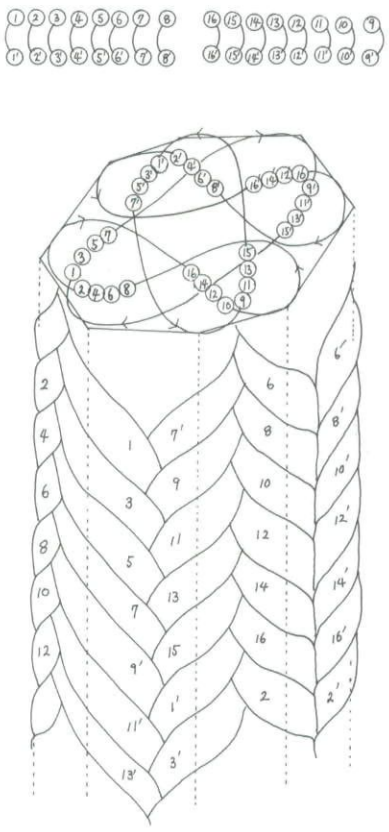


Fig. 7. Diagram of [5]. Braid no. 2, Genjiuchi *(Genji Braid). Example: 8 + 8 = 16 loops, 32 strands*

connote a pair of complementary subjects. It is, therefore, construed that they represent the two kinds of transfer of loops instructed in the procedure for braid no. 1; "yang" for one which is "from the outer heaven to the inner earth" and "yin" for the other "from the outer earth to the inner heaven."

As for "upper-sides" and "insides," they were explained earlier in the paragraph for "Mode of Manipulation of Strands": the "upper-side" loops are those which transferred around the outside of the remaining loops, and the "inside" loops through the inside.

Three modes out of eight are introduced for genji braid procedure in addition to the four for braid no. 1.

[6] Pseudo-Genji Braid [Braid no. 3][38] (Fig. 8)

Steps 1 and 2: The same as genji braid.

Steps 3 and 4: Twist the loop a half turn as it is transferred to the other hand.
Beat between steps. Repeat the four steps.

16 loops, 8 loops in each hand.

[MK] The last of the eight modes of manipulation is introduced for this procedure.

The procedure for pseudo-genji braid does not seem to have any ambiguity if the number of the loops and their allotment to each hand are assumed to be the same as those of genji braid; 16 loops, 8 for each hand. However, in subsection [3] where the loop number and their allotment are specified, genji braid is listed but pseudo-genji is not. In such a situation, in the Japanese language convention, it is understood that the specification includes pseudo-genji, even if it does not specifically mention it. Since this document, however, omits key information here and there, considering other possibilities of loop numbers and their allotments may be of interest. One may consider, for example, two kinds of allotment of 16 loops: 8 loops in each hand, and 9 loops in the left hand and 7 in the right. These two allotments manipulated with this procedure produce two structurally distinctive and significant braids.[39] Structural analysis and the relationship of these braids to braids constructed by stand-and-bobbin technique will be discussed in a separate publication.

[7] Double-Square Braid [Braid No. 4][40] (Fig. 9)

Step 1: Pick up the outermost loop held around the left hand by the fingers of the right hand, transfer it around the outside of the rest of the loops on the left hand and deposit it to the left of the innermost loop of the right hand.

Step 2: The same as above but right to left.

Step 3: Pick up and slip out the outermost loop held around the left hand by the fingers of the right hand inserted through the inside of the rest of the loops on the left hand, twist a half turn and deposit to the left of the innermost of the right hand.

Step 4: The same as step 3 but from right to left. Beat between steps. Repeat the four steps.

An odd number of loops in each hand. Example: 7 loops on each hand.

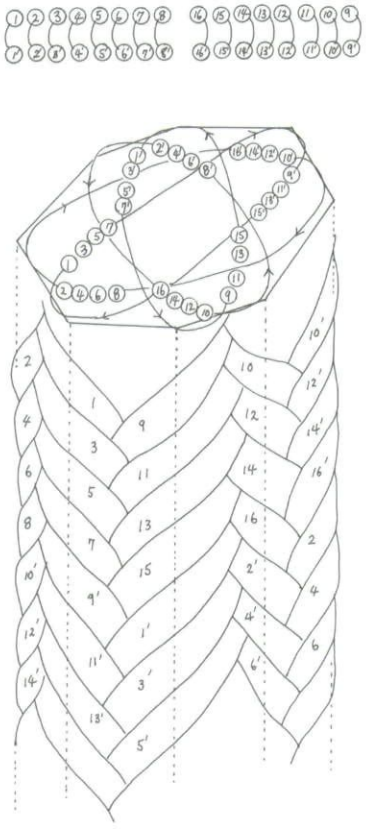


Fig. 8. Diagram of [6]. Braid no. 3, Nise Genjiuchi *(Pseudo-Genji Braid). Example: 8 + 8 = 16 loops, 32 strands*

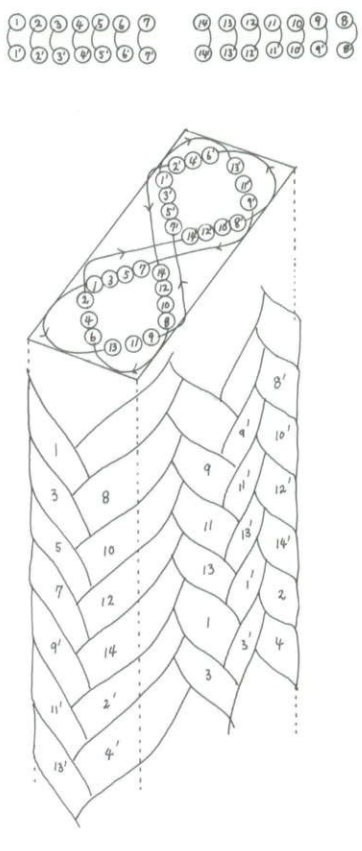


Fig. 9. Diagram of [7]. Braid no. 4, Shikaku Nihon'uchi *(Double-Square Braid). Example: 7 + 7 = 14 loops, 28 strands*

[MK] Missing from the instruction of braid no. 4 in the text is information as to the number of loops required and their allotment to each hand. This information is as crucial here as it is for braids nos. 1, 2, and 3. To compound the problem (1) only two steps are mentioned so that the instruction misleads the process as having only two steps, when actually it must have four, (2) the name of the braid given in the text, *shikaku nihon'uchi* is not found in modern braid nomenclature,[41] and (3) it is ambiguous in that it can be taken as either "two square braids" or a "two-square braid" (double-square). Therefore, it is difficult to seek reference among known braids to which the structure may be compared.

The braiding procedure for Braid no. 4 ultimately was reconstructed through analysis of the construction principle of the loop-manipulation technique and in particular, the relation of the number of the loops to the mechanism of interworking of strands. To arrive at a braid that has two square braids as component structures, I deduced that the process would require four steps, the omitted first two steps being modes A and B, and an odd number of loops in each hand. These four steps produce the braid no. 4, which in modern *kumihimo* terms is commonly known as *mitakegumi.* While the allotment of either seven loops on both hands or nine to the left and seven to the right works, the latter yields a braid with a better balance.

[8] Square Braids [Braid no. 5A] [42] (Fig. 10)

Steps 1 and 2: The same as braid no. 4, steps 1 and 2.

Steps 3 and 4: The same as braid no. 4, steps 3 and 4 but without a twist.
Beat between steps. Repeat the four steps.

An odd number of loops in each hand. Example: 7 loops in both hands.

[MK] Although the description for this process has the same ambiguity as the one for braid no. 4, if no. 4 is understood, no. 5A is self-explanatory. This procedure simultaneously produces two separate square braids, whereas the preceding one produces a structure in which the two square braids are interconnected.

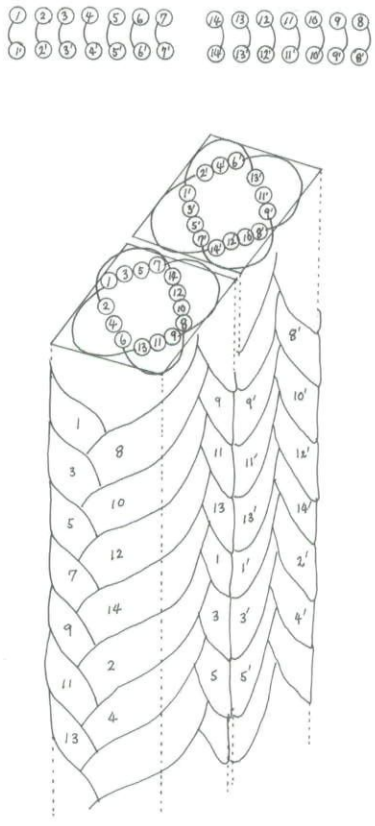


Fig. 10. Diagram of [8]. Braid no. 5A, Shikakuuchi *(Square Braids). Example: 7 + 7 = 14 loops, 28 strands. This procedure simultaneously constructs two separate square braids. The track-plans show a close structural relationship between braids no. 4 and no. 5A*

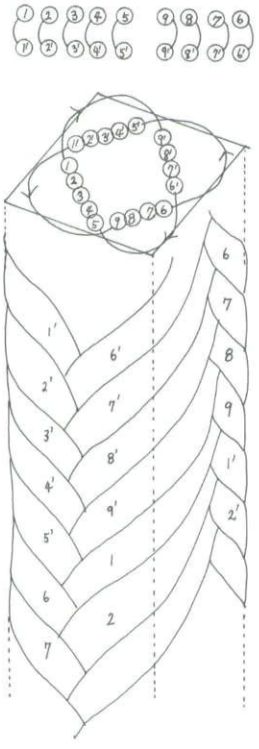


Fig. 11. Diagram of [8]. Braid no. 5B, Shikakuuchi *(Square Braid). The oval tracks are elongated to accommodate spaces for drawing in the dots, i.e., the position of loops on the tracks so that they are visually in accord with the position of those on the hands. Example: 5 + 4 = 9 loops, 18 strands*

[8] A Square Braid [Braid no. 5B] (Fig. 11)

Step 1: Pick up the outermost loop held around the left hand by the fingers of the right hand, transfer around the outside of the rest of the loops on the left hand, twist a half turn and lay it to the left of the innermost loop of the right hand.

Step 2: The same as step 1 but right to left. Beat between steps. Repeat the two steps.

[8] A Square Braid [Braid no. 5C] (Fig. 12)

The same as the preceding procedures but transfer the loops through the inside of the rest of the loops on each hand.

[MK] Any number of loops may be used for both no. 5B and no. 5C. An odd number of loops, however, produces braids that are more structurally balanced. The loops are divided into two equal groups and the odd loop, if any, goes to the left hand.

Although the directions for braids no. 5B and no. 5C might be read as cases in which some of the steps have been abbreviated, they are, in fact, repeats of two-step processes.

[9] Braiding Procedure, Flat Braids [Braid no. 6] (Fig. 13)

Step 1: Pick up the outermost loop held around the left hand by the fingers of the right hand, transfer around the outside of the rest of the loops on the left hand and deposit to the left of the innermost loop on the right hand.

Step 2: The same as above but in the opposite direction. Beat between steps. Repeat the two steps.

[MK] The requirement for the number of loops is the same as braid no. 5B and no. 5C. This instruction simultaneously yields two separate flat braids.

[10] Take-up of Yarn

[MK] The initial length of strands is approximately 140 percent of the finished length of a braid.

[11] Examples of Color Arrangement

[MK] From the original thirty-one examples in "Soshun Bikō" seven are repre-

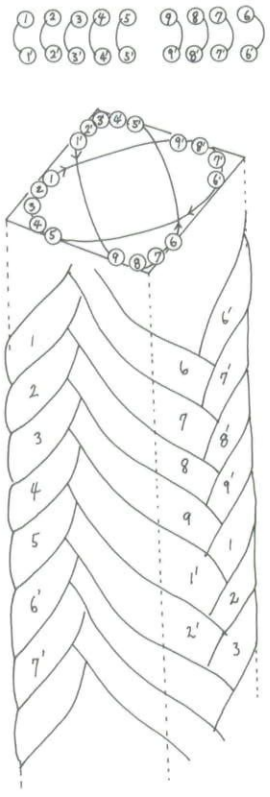


Fig. 12. Diagram of [8]. Braid no. 5C, Shikakuuchi *(Square Braid). Example: 5 + 4 = 9 loops, 18 strands*

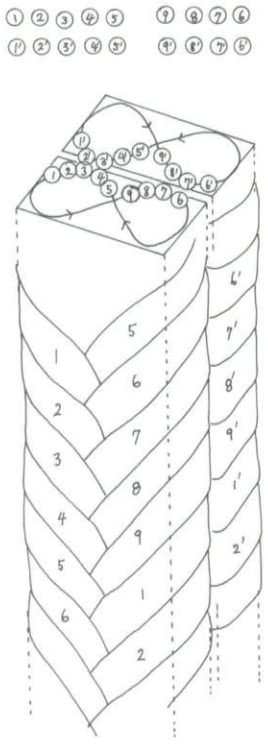


Fig. 13. Diagram of [9]. Braid no. 6, Kumi no Shidai *(Braiding Procedure). Example: 5 + 4 = 9 loops, 18 strands. Two lines of flat braids with two ridges are simultaneously constructed. The track-plans in Figures 11, 12, and 13 show the structural relationship of braids nos. 5B, 5C, and 6.*

sented here to demonstrate some of the variety in the number of colors and loops.

Colors used in the examples are white, green-yellow, navy, purple, black, red, yellow, and lavender. Lavender is used only in two examples taken from the records of the Mano family.[43]

Abbreviations for color designation:
wh—white = *shiro*
yl—yellow = *ki*
bk—black = *kuro*
gy—green-yellow = *moegi*
pl—purple = *murasaki*
lv—lavender = *usumurasaki*
rd—red = *aka*
nv—navy = *kon*

In the following chart, top rows show the colors of the upper shanks of the loops, and the bottom rows those of the lower shanks. The colors grouped on the left hand side, **L,** are for the loops which are initially held in the left hand, and those on the right side, **R,** are for the loops which are initially held in the right hand.

[1] Four-color pseudo-kikko, 13 loops, 26 strands

L	pl	gy	pl	pl	gy	wh	pl	wh
	nv	gy	pl	pl	gy	wh	nv	wh
R	pl	wh	pl	wh	pl			
	nv	wh	nv	wh	nv			

[MK] [2–4] are omitted from translation.

[5] Five-color *takuboku irokumi,* 13 loops, 26 strands—used also for genji braid

L	yl	nv	yl	nv	rd	wh	rd	wh
	yl	nv	yl	nv	rd	wh	rd	wh
R	gy	wh	gy	wh	gy			
	gy	wh	gy	wh	gy			

[MK] [6–18] are omitted from translation.

[19] Four-color *takuboku,* 9 loops: color design from other source—*Mano's record*

L	gy	gy	pl	wh	pl	wh
	gy	gy	nv	wh	nv	wh
R	pl	wh	pl			
	nv	wh	nv			

[MK] [20–26] are omitted from translation.

[27] Five-color *muname takuboku,* 13 loops,

26 strands—from *Mano's record*

L	wh	wh	wh	lv	gy	lv	gy
	wh	wh	wh	wh	lv	gy	lv
R	wh	pl	nv	pl	nv	lv	
	wh	nv	pl	nv	pl	gy	

[MK] [28] omitted from translation.

[29] Five-color 15-loop—used for both *genji* and *odoshige*

L	yl	nv	yl	nv	wh	rd	wh	rd
	yl	nv	yl	nv	wh	rd	wh	rd
R	nv	gy	wh	gy	wh	gy	wh	
	nv	gy	wh	gy	wh	gy	wh	

[30] Genji braid, four-color, 32-strand

L	gy	pl	nv	pl	nv	pl	nv	gy
	gy	nv	pl	nv	pl	nv	pl	gy
R	gy	wh	wh	wh	wh	wh	wh	gy
	gy	wh	wh	wh	wh	wh	wh	gy

[31] Genji braid, 32-strand *irokumi*—from *Mano's record*

L	gy	lv	nv	wh	nv	wh	nv	wh
	gy	lv	wh	wh	wh	wh	wh	wh
R	pl	nv	pl	pl	pl	pl	lv	lv
	nv	wh	wh	wh	nv	wh	gy	lv

[12] Diagrams and Specifications for Hand-Braiding Beater Stand (Figs. 15A–C)

[13] Straps Held in the Hands for Braiding (Fig. 16)

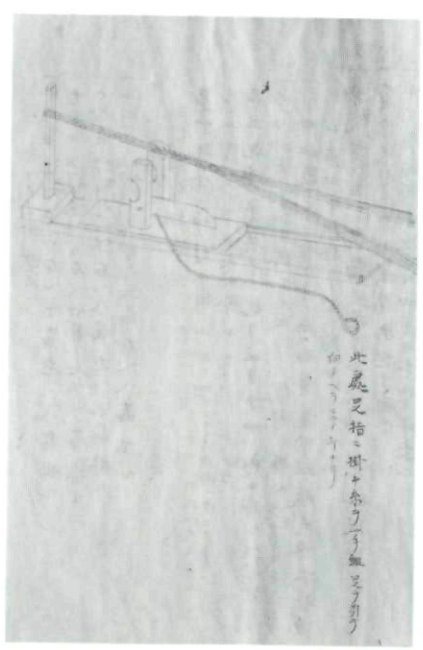


Fig. 14. From the original. Upper right caption: Diagram of the manner of holding the twenty-six strands in the left and right hands—the "Braiding Technique by Oral Transmission." Bottom center caption: "This [loop at the working end of the rope] is hooked on the toes. After each manipulation [the fell of a braid is] beaten with the sword pulled by [the rope which is tied to] the foot." An example of twenty-six strands [thirteen loops] is shown; five loops are aligned and held around the right hand and eight around the left. Instructions for operating the foot beater by the strap attached to the beater is given. From the diagram, the positioning of a braid stand and beater can be learned. The strands are drawn with heavier lines near the hands, attesting to the use of hand straps

[MK] A "strap," a string made of sturdier and heavier material than that of the braid, is inserted into the looped end of each of the paired strands. A braider, therefore, holds the straps, not silk threads, in the hands. This explains the earlier statement in the summary [1], "since the hands do not touch the yarn, it retains its lustre."

[14] List of the Confidential Technique of Braiding

[MK] Eighteen headings omitted, most of them dealing with stand-and-bobbin techniques.

The details of those listed above are not recorded here because they are described in [chapter 3] "the Most Confidential Orally Transmitted Braiding Techniques."

Commentary

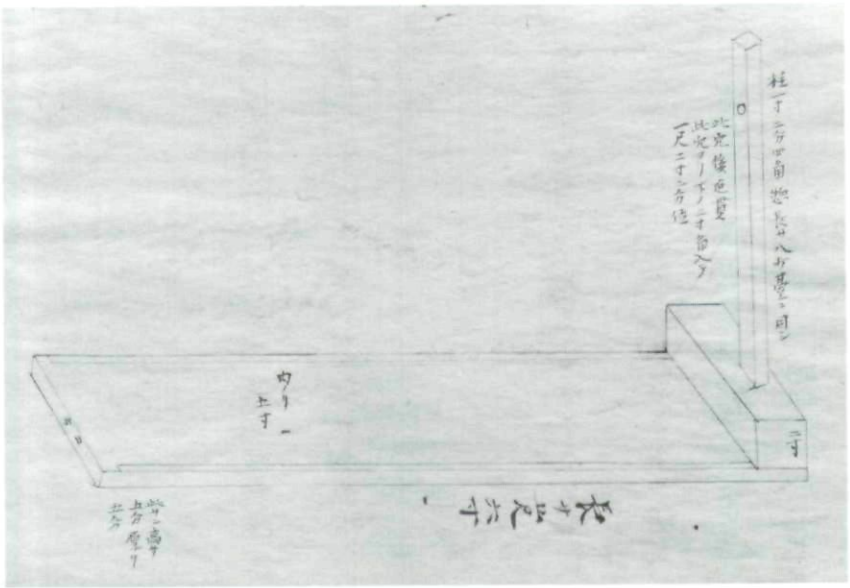
Summary

"Soshun Bikō" provides notes on making flat and round braids, but it is not a complete instruction book. Some information on fundamentals is deliberately omitted whereas details of certain braiding processes, specifications for tools, requirements for armor, silk processing, yarn preparations, and finishing techniques are meticulously described.

Directions for eight braiding procedures are given. From them, six obliquely interworked structures can be obtained. In the Table of Contents they correspond to Braid no. 1: [4] Mode of Manipulation of Strands, Braid no. 2: [5] Genji, Braid no. 3: [6] Pseudo-Genji, Braid no. 4: [7] Double-Square, Braid no. 5A, no. 5B, and no. 5C: [8] Square Braids, Braids no. 6: [9] Braiding Procedure.

It should be noted that of the three procedures, no. 5A, no. 5B, and no. 5C, which produce square braids, no. 5A simultaneously yields two square braids. This means that each of the two braids has half as many strands as the braids no. 5B and no. 5C when the same number of loops are used. The result from the process for braid no. 5A, therefore, can be considered as a distinctive structure, bringing the number of described structures to seven.

It is probable that braid no. 1, Mode of Manipulation of Strands, was the



Figs. 15A and 15B. From the original.

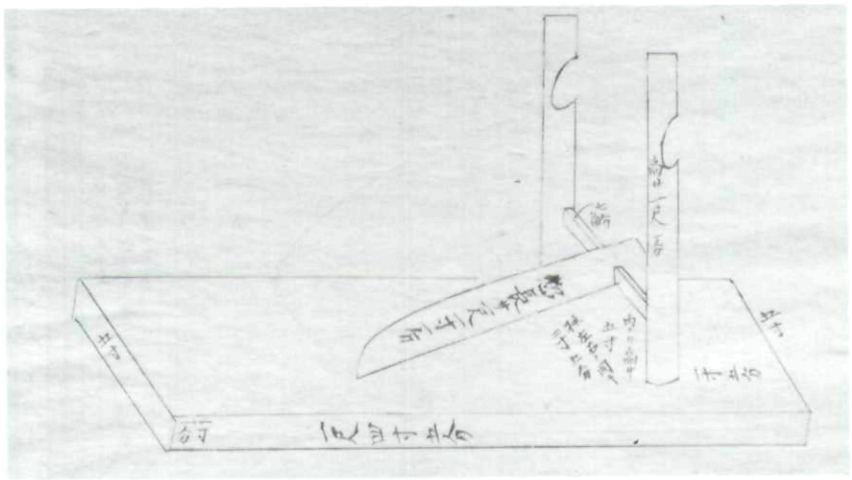


Fig. 15A, upper right caption: "The measurements of hand-braiding stand." The braiding stand consists of two sections, a beater section [A] and a baseboard [B]. The beater section is placed on the baseboard. The position of the beater can be adjusted by sliding it along the baseboard in order to position the beater against the fell of a braid The baseboard has a post to which the apex of braiding strands is fastened. As the braiding progresses and the fell moves forward, it is presumed that the braid length is shortened to advance the fell by wrapping the braid around the post. The specifications for the parts of the beater indicate that the beater is heavily built

major product of the hand-held loop-manipulation method in early nineteenth-century Japan, because more information is given on braid no. 1 than on any of the other braids listed. Any information in the text on loop-manipulation technique, when it is given without reference to a specific braid, generally turns out to be for braid no. 1. Interestingly, unlike other braids, braid no. 1 does not have a name based on its structure but is known only by the names for certain designs based on color effect such as *takuboku* and *kikkō*, or by its usage or function such as *odoshige.*

Hand Straps

In the drawing (Fig. 14), the lines appear heavier and darker where they indicate strands held around the hands, whereas they are thinner and lighter at a certain precise distance from the hands. Although such differences can be discerned in other illustrations of braiders, detailed specifications for hand straps are found only in "Soshun Bikō" (Fig. 16).[44] The insertion of a sturdier material in the looped end is not limited to the Japanese method, but I consider it the most important element in making this technique practicable, particularly in braiding silk strands.[45] The straps of paper-twist provide firmer and heavier loop ends to hold in the hands, thus clarifying their separation and helping to keep the sequence of the loops while they are being manipulated.[46] An additional merit from the insertion of straps at the end of the strands is that it allows the braiding to come close to the ends of yarn, thereby reducing wastage of precious silk threads.

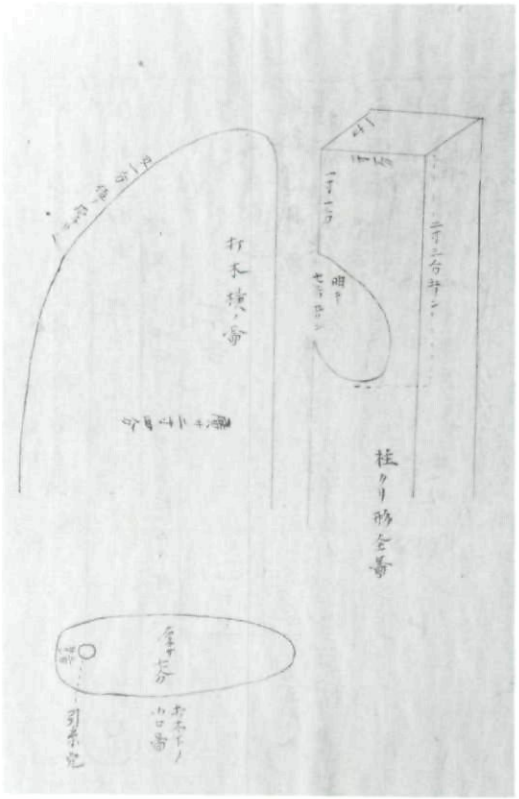
Examples of Color Arrangement

The thirty-one examples given in the original "Soshun Bikō" are summarized by the number of loops and the braid names:

1 thirteen-loop *nise kikkō* [pseudo tortoise-shell]
1 thirteen-loop *kikkō*
8 fifteen-loop *takuboku* [woodpecker]
8 thirteen-loop *takuboku*
6 eleven-loop *takuboku*
5 nine-loop *takuboku*
2 sixteen-loop *genji*

Except for the first two and the last two, the examples are for *takuboku,* attesting to the prevalence of that pattern.

Figs. 15C (left) and Fig. 16 (right). From the original. The measurements for the side posts and beater sword



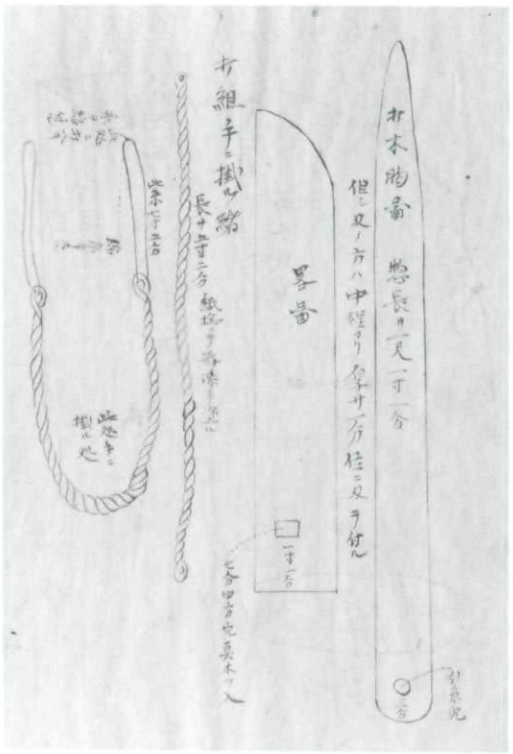


Fig. 16. Copy from the original. Upper center caption: "The straps for the braiding hands." Upper left, between the two loops of cotton thread: "Tie the strands to be braided to these [loops]." A hand strap (ca. 20 cm), made of a plied string of a twisted paper strip, is sized with japan lacquer to make it smooth and durable. Both ends are looped, through each of which a loop of cotton thread (ca. 28 cm) is attached. This provides a bridge between the strap and the silk braiding strands

Two *takuboku* examples, [5] for 13 loops and [29] for 15, have notes that they can also be used for genji braid. Although 16 loops are required for genji braid, there is no explanation on how to adjust the discrepancies.

Four examples cite Mano's records.[47]

Diagram and Specifications for Hand-braiding Beater Stand.

One may question the claim that this is "hand-braiding where no stand or bobbin is used" when in fact a beater stand is used. The claim may still hold, however, because the stand is merely for fastening the top of the braids and beating the structure, and has nothing to do with the interworking process of the braid. In any event, the function of the beater stand for constructing a 2.5 meter long braid, is to eliminate the need for an assistant to beat the fell of a braid. Methods for tightening structures of braids, such as stretching out both arms or using a foot, two common methods among folk braiders for the finger-held loop-manipulation technique, limit the length of braids to within one's reach. The former method, moreover, is not practical for the hand-held method because the sequence of the strands in the hands tends to get lost when the arms are stretched out. Having an assistant beat the fell is also practiced for finger-held loop-manipulation techniques as well as for the Omani hand-held technique. A foot-operated beater of the kind described in "Soshun Bikō" for this purpose is not found in any other culture, to the best of my knowledge.[48]

A three-line subsection in chapter 3, "the Most Confidential Orally Transmitted Braiding Technique," brings up the importance of control in beating. This implies that there is a certain skill required to master the operation of the beater.

In loop-manipulation braiding, uniform tightening of the structure is crucial not only to control firmness but also to control the width of the product. The importance of uniformity in the width and structure of lacing braids, for instance, can be understood from the fact that hundreds of lamellae are laced together to form a panel for a suit of armor. A slight variation in width or thickness of braids will considerably affect the end product. With the loop-manipulation technique, skill in beating is the most important factor for producing

braids of a uniform width or thickness. This is because the uniformity of surface structure in a braid is intrinsically maintained by the working system of loop-manipulation and does not depend on the skill of a braider as much as do other braiding techniques.

Conclusion

Historically intangible technical skills are rarely recorded in detail. To study the history of textile technology, other than learning from fortuitously preserved artifacts, one has to depend on vague literary writings or visual materials, such as paintings and book illustrations, as sources of information. While these materials are valuable as general information, they hardly provide crucial details. "Soshun Bikō" is, though vague in some details, a rare informative source for understanding our technological heritage.

For the hand-held loop-manipulation method, eight modes of manipulation can be derived. All eight modes are used in various combinations in the methods described in "Soshun Bikō." Other than those found here, the only method on record is, to the best of my knowledge, a combination of four modes practiced in Oman to produce camel reins.[49] A unique feature of the hand-held loop-manipulation technique is the construction of one- to four-layer structures, while working simultaneously on four levels.

Presented here for the first time, I believe, are the procedures for "Mode of Manipulation of Strands" (braid no. 1), "Genji Braid" (braid no. 2), and "Double-Square Braid" (braid no. 4). Additionally, the Genji braid (braid no. 2) structure, regardless of procedure, is introduced. The other five braids out of the eight documented in "Soshun Bikō" (nos. 3, 5A, 5B, 5C, and 6) are accounted for and discussed in *The Manual of Braiding.*

My experiments on the efficiency of the technique confirmed the claim in "Soshun Bikō" that the method yields a braid much faster than stand-and-bobbin methods. In my experiments, tightening of the structure was done by pressing the fell with my foot.

In 1867, the feudal Tokugawa Shogunate was dissolved and the Meiji government established. In 1876, the government prohibited the wearing of swords. Armor, no longer an effective protection against modern warfare, had lost the reason for its existence. The loss of the major source of demand for handmade braids, coinciding with the importation of power braiding machines in the late nineteenth century, brought traditional Japanese braiding close to extinction. The advantage of the loop-manipulation method had rested on its production efficiency over other hand braiding, not on its structural versatility; it could neither compete with nor adapt to the more efficient mechanical means and so became obsolete.[50] *Kumihimo,* the free-end technique, found ways to survive.

As I conclude this report, I am more convinced than ever that the loop-manipulation braiding technique was an important professional skill long before the fifteenth century, the earliest date of the supporting evidence that was found.[51] It was an important and efficient production method that supplied the armor manufacturers with large quantities of lacings totaling hundreds of meters for each suit. It is conceivable that the braid of this particular structure (single-layer twill with eight ridges) was put to use for lacing of the armor, not only for the obvious reasons of being functionally suitable—thin, flexible, and mechanically durable—but also because this technique had existed or been successfully developed.[52] The technique exploits the ability of our two hands fully; the ingenuity that conceived such skill by the desire to achieve variety, quality, and quantity in manufacturing, is truly astonishing.

Acknowledgments

I would like to thank Noémi Speiser, the author of the most comprehensive book on braiding, who recognized the value of my research on hand-held loop-manipulation technique outlined in "Soshun Bikō" and urged me to publish it. She has shared generously her ideas and materials, and advised me on terminology and a drawing scheme, the track-plan. Joanne S. Brandford has guided me in my research, spending many hours discussing ideas. Joanne, Monica Bethe, and Nobuko Kajitani have

read the manuscript and offered valuable suggestions. Kisemi Shimotori and Kiyoshi Terada allowed me to study S. Shimotori's unpublished research materials. The town of Kurobane gave me permission to phototgraph Ōzeki's portrait and the original *Shika Sūyō* as well as to photocopy its contents. Dōmyō Braiding Co. offered me access to the rare Mano family manuscripts. My acknowledgment extends to my husband, Tōichirō, and daughter, Kay, for helping me with valuable suggestions and constant encouragement.

Notes

1. Over three hundred braids stored in the Imperial Treasury of Shōsōin, Nara-shi, Japan, since the eighth century are reported in *Shōsōin no Kumihimo* (Braids in the Shosoin), Shōsōin Jimusho, comp. (Tokyo: Heibonsha, 1973). Braids from the seventh century, the oldest extant in Japan, are found among the treasures stored in Hōryūji Temple, Ikaruga-chō, Nara-ken, Japan.
2. Terminologies on braiding techniques used in this article follow, as much as possible, those defined in Noémi Speiser's *The Manual of Braiding* (Basel: Privately published, 1983). Romanization and word division of Japanese words follow the current rules of the Library of Congress.
3. The majority of the European language publications listed below are introductory articles with or without instructions for braiding procedures. None of them discusses the subject of this paper, hand-held loop-manipulation technique. So far, no scholarly studies on the history of *kumihimo* technology, supported by evidence, have been reported. Shinbē Dōmyō, "L'évolution du KOGEI KUMIHIMO en rapport avec les Arts du Nettage, du Tricotage et du Tissage," *Bulletin de Liaison du Centre International d'Étude des Textiles Anciens,* 24 (1966): 41–68; Mary Dusenbury, "Braiding in Japan," in *In Celebration of the Curious Mind,* ed. Nora Rogers and Martha Stanley (Loveland, Col.: Interweave Press, 1983): 80–102; Masako Kinoshita, "Kumihimo: An Ancient Japanese Bobbin Braid," *Shuttle Spindle & Dyepot* 9 (1977): 117–119, and 11 (1980): 19–21, 64, 65: Jules Kliot and Kaethe Kliot, *Kumi-Himo, Techniques of Japanese Plaiting* (Berkeley: Privately published, 1977); Catherine Martin, "Kumihimo: The Japanese Art of Braid Making," *Crafts,* 69 (July/August, 1984): 30–35; idem, *Kumihimo: Japanese Silk Braiding Techniques* (Leominster: Old Hall Press, 1986); Noémi Speiser, "The Japanese Art of Braiding," *CIBA-Geigy Review* 4 (1974): 24–35; idem, "The Technique and the Method of Braiding: A Technological Research in Progress," *Bulletin . . . des Textiles Anciens,* 36 (1977): 42–53; idem, *Manual of Braiding,* 20–25, 151–175. For more references see ibid., 240.
4. Dusenbury, "Braiding in Japan," 81, 85; Martin, "Braid Making," 33; idem, *Silk Braiding Techniques,* 12; Shōsōin Jimusho, *Shōsōin,* 25, 26, iv.
5. Susan S. Bernal, "Slentre Braiding," *Shuttle Spindle & Dyepot* 9 (1978): 63, 64, 67.
6. There are two types of loop-manipulation techniques: finger-held and hand-held, as will be explained later in the text. The literature in hand-held loop-manipulation techniques: Gigi Crocker and Bonnie Glover, "An Omani Braiding Technique for Camel Reins," *The Journal of Oman Studies* 5 (1979): 103–106; Speiser, *Manual of Braiding,* 146–148. The literature in finger-held loop-manipulation braiding: Bernal, "Slentre"; Marianne Cardale-Schrimpff, "Techniques of Handweaving and Allied Arts in Colombia" (Ph.D. diss., Oxford University, 1972); Marjorie Cason and Adele Cahlander, *The Art of Bolivian Highland Weaving* (New York: Watson Guptill, 1976), 143, 144; Adele Cahlander, "A Detective Story: Unravelling the Mystery of a 7-Loop Braid," *The Weaver's Journal* 10 (1985): 12, 13; Elsa E. Gudjónsson, "Icelandic Loop-Braided Bands: Krílud Bönd," *Bulletin . . . des Textiles Anciens* 39 (1979): 65–68; Takako Kanomi, "Karen-zoku no Ishō" (Costumes of Karen Tribe), *Senshoku to Seikatsu* 30 (1980): 113; N. I. Lebedeva, "Priadenie i tkachestvo vostochnykh slavian v. XIX–nachale XX v.," *Trudy Instituta Etnografii im. N. N. Mikluho-Maklaia* n.s., 31 (1956): 497–505; Joan Michaels-Paque, *A Creative and Conceptual Analysis of Textiles* (Privately published, 1979), 94–102; Walter Roth, "An Introductory Study of the Arts, Crafts and Customs of the Guiana Indians," *Report, U.S. Bureau of American Ethnology,* no. 38, 1916, 148–158; Speiser, *Manual of Braiding,* 124–145; idem, "Unusual Braids Produced by Loop Manipulation," *The Weaver's Journal* 10 (1985): 15–18, 67–73. Finger-held loop-manipulated methods are reported to exist in some rural areas in eastern Japan: Toshiko Kitamura, "Dōgu o tsukawazu ni kumu hōhō no kiroku" (Record of a no-tool braiding method) (unpublished, 1975); Speiser, *Manual of Braiding,* 140. Personal correspondence, 12 April and 29 May 1983, Yōko Takaoka, Hitachi, Japan.
7. *Shichijūichiban Shokunin Utaawase* (Poetry Match of Seventy-One Pairs of Artisans), illus. by Mitsunobu Tosa, 1434–1525. (Although the original no longer exists, there are several copies from the seventeenth century.) *Shokuninzukushie* (Pictures of Artisans)—this is a folding screen, designated as a national treasure—

painting attributed to Yoshinobu Kanō, d. 1640 (Kitain Temple, Kawagoe-shi, Japan). This painting is considered to be a copy of an earlier painting that no longer exists. Also, several other paintings of the identical theme exist: *Wakoku Shoshoku Ezukushi* (Pictures of Japanese Artisans), Moronobu Hishikawa (ca. 1618–ca. 1694) (1685); *Jinrin Kinmō Zui* (Illustrated Encyclopedia of Artisans), Genzaburō, (1690); *Onna Daigaku Takarabako* (Treasure Chest of Women's Know-How), Ekken Kaibara (1630–1714) et al., (1716).

8. Copied from *Nihon Shomin Seikatsu Shiryō Shūsei,* vol. 30 (Historical Materials on the Life of the Common People) (Tokyo: San'ichi Shobō, 1968–1984).
9. Shinbē Dōmyō, *Himo* (Cords, Strings, and Braids) (Tokyo: Gakuseisha, 1963), 92; Masayoshi Fujimoto, *Kumihimo no Kenkyū* (Study of Kumihimo) (Kyōto: Nihon Itomono Shinpōsha, 1927), 73; *Kitain Shokuninzukushie Byōbu* (The Folding Screen of Kitain Temple with Pictures of Artisans) (Tokyo: Azuma Shuppan, 1979), kaisetsu, 28; *Shichijūichiban Shokunin Utaawase; Shokuninzukushie; Iroe Shokunin Burui* (Poetry Match of Seventy-One Artisans; Pictures of Artisans; Colored Pictures of Artisans) (Tokyo: Kōwa Shuppan, 1977), 31; Yukihiro Tsunoyama, *Nihon Senshoku Hattatsushi* (History of Japanese Weaving and Dyeing) (Tokyo: San'ichi Shobō, 1965), 132.
10. Dōmyō, *Himo,* 94. Yasushige Mano, a subject of the fief of Inuyama (Inuyama-shi, Aichi-ken), is known as the man who reconstructed, in 1809, a twelfth-century braid stored in Mitake Shrine (Tokyo). Mano's records are also cited in "Soshun Bikō," the subject of this article, attesting to the existence of at least one earlier document of the hand-held loop-manipulation braiding technique. The originals of these unpublished manuscripts have not been located, to the best of my knowledge.
11. "Mano-ke Den Kojitsu Itokumi Tetsuke" (Proprietary Braiding Techniques of Mano Family), manuscript copy of 1819, I.
12. Masunari Ōzeki, "Shika Sūyō" (unpublished manuscript, nineteenth century), 176-chapter version, chapters 142–144. The chapter numbers appear incorrectly as 147–149 on the cover of the original "Soshun Bikō" (Fig. 2). "Chapter" stands for *kan* when the term is used in classic Japanese books for marking a division. In contemporary publication, however, *kan* corresponds to volume. In "Shika Sūyō," the chapter numbers are consecutively given throughout regardless of parts dealing with different subjects.
13. Seiken Shimotori, *Shika Sūyō Shō* (Selection from the Thesaurus of Ceasing War) (Tokyo: Privately published, 1941), v.
14. The method I am describing encompasses more than the "oblique interlacing" used by Irene Emery in *The Primary Structures of Fabrics* (Washington, D.C.: The Textile Museum, 1980).
15. Table of contents of the "Shika Sūyō" (176-chapter version): chs. 1–37, "Shiritsu Yōryaku" (Essentials on Military Strategies); chs. 38–92, "Hyōgi Tōki" (Survey on Military Arts); chs. 93–126, "Kikai Sahō" (Manual for Production of Arms and Armor); chs. 127–141, "Kishoku Ihen" (A Collection of Looming Arts); chs. 142–144, "Soshun Bikō" (Notes on Braiding); chs. 145, 146, "Saishiki Ruiju" (Classified Collection of Coloring Arts); chs. 147–156, "Kōshō Hōroku" (Collected Records of Craftsmen); chs. 157–176, "Hōyō Yōdan" (Essentials on Falconry).
16. Chinese character *bu* 武 (military) is constructed of two component parts, each of which, when used as an independent character, has its distinctive meaning; *shi* 止 (stop) and *ka* 戈 (spear).
17. Seiken Shimotori, *Shika Sūyō Shō* Tokyo: Shomotsu Tenbōsha, 1946), supplement.
18. *Kokusho Sō Mokuroku,* vol. 4 (Catalogue of Japanese Books [published before 1867]) (Tokyo: Iwanami Shoten, 1963–1976), 19. *Naikaku Bunko Mikan Shiryō Saimoku,* vol. 1, (Annotated Catalogue of Unpublished Materials in the Cabinet Library) (Tokyo: Kokuritsu Kōbunshokan Naikaku Bunko, 1977–1978), 128. The date when the 176-chapter version was written is not known but it is presumed to be prior to the start of work on the 353-chapter version.
19. *Kishoku Ihen* is also published as photo reproduction prints in *Nihon Kagaku Koten Zensho,* vol. 13 (Japanese Science Classics), ed. Hiroto Saigusa (Tokyo: Asahi Shinbunsha, 1946); *Fukkoku Nihon Kagaku Koten Zensho,* vol. 8 (Reissue of Japanese Science Classics) (Tokyo: Asahi Shinbunsha, 1978); *Edo Kagaku Koten Sōsho,* vol. 15 (Science Classics of the Edo Period) (Tokyo: Kōwa Shuppan, 1979). The title of this monograph appears as *Hataori Ihen* in *Nihon Senshoku Bunken Sōran* (Annotated Bibliography of Japanese Weaving and Dyeing), ed. Shōichi Gotō (Kyōto-shi: Senshoku to Seikatsusha, 1980).
20. See note 17 for the second issue of Shimotori's *Shika Sūyō Shō.* "Soshun Bikō," *Shika Sūyō Shō,* vol. 5 is reprinted in: Kōjirō Suganuma, *Kyō Kumihimo* (Kumihimo of Kyōto) (Kyōto-shi: Zen Kyōto Kumihimo Rengōkai, 1978), 386–447. Excerpt from ch. 1 of the same: K. Suganuma et al., *Kumihimo* (Ōtsu-shi: Minzoku Bunka Kenkyūkai, 1969), 157–168.
21. Iron plaques have also been used for lamellae. For lacing, leather and fabric strips have also been used.
22. Ridge: "an alignment of floats, each of which is set over by one element of the countered course. This is usually called a "twill-line" in weaving" (Speiser, *Manual*

of Braiding, 237).

23. Simpler braids, flat braids with two or four ridges, were used before the twelfth century to lace on the armor. These braids can also be made by loop-manipulation.
24. In the Edo period, during which there was no major civil disturbance, an upsurge of armor braid production was seen. This is due to the fact that armor of earlier periods, which required more braids than that of later periods, was restored or reproduced and worn on ceremonial occasions.
25. Dusenbury, "Braiding"; Martin, "Braid Making"; Speiser, "Method of Braiding"; idem, *Manual of Braiding,* 151–161.
26. Martin, "Braid Making," 33; idem, *Silk Braiding,* 12; *Kumihimo* (Tokyo: Tairyūsha, 1978), 198; Dusenbury in "Braiding," 89, writes her conjecture on the existence of *takadai* prior to the Edo period.
27. See note 3. The dates of illustrated documentary sources for *marudai,* found to date, do not go as far back as those of the loop-manipulation technique.
28. In Japanese convention, when itemizing the contents in a list, each item, which would be numbered consecutively in the Western convention, is headed by the number "one." Western numeration, in brackets, has been used here to minimize confusion.
29. As will be explained later in the subsection [13] "Straps Held in the Hands for Braiding."
30. These are the units for measuring the length of textiles used in the late Edo period. 1-*sun* = 3.8 cm, 10-*sun* = 1-*shaku* = 38 cm, 10-*shaku* = 1-*jō* = 379 cm.
31. *Kikkō* (tortoise-shell) is a traditional Japanese design motif, and its iconography is to invite good luck and longevity. The literal translation of the word *ryōmen* is "both faces." The word is translated as "reversible," not double-face, because the braid which is dealt with here is a single-layer braid.
32. *Takuboku* (woodpecker) is a traditional braid design name. The origin of the name is unknown.
33. *Anaaki shikakuuchi* cannot be accounted for elsewhere in "Soshun Bikō" or in contemporary *kumihimo* nomenclature.
34. The braid name *genji* is said to have been taken from the name of a powerful warrior clan in the eleventh–twelfth century. *Genji* and *nise genji* are both braids with an octagonal (or round) cross section.
35. The meaning of *tatsumi* will be found in the explanation of Mode C in this subsection.
36. The word "twist," the author Ōzeki's use of the word, is retained in this article. The word is used, as a verb or a noun, to convey an action but not the degree of turn. Speiser describes the result of this manipulation as "crossed shanks [of the loop]" in *The Manual of Braiding,* 127.
37. These Chinese characters, pronounced in Japanese *ken* or *inui* 乾, *kon* or *hitsujisaru* 坤, are Sino-Japanese astrological terms. Each character represents an astrological attribute and a spatial direction as specified in the interpretation of the text. *Tatsumi* (southeast) 巽, *in* (yin) 陰, and *yō* (yang) 陽 are also used in the same connotation.
38. *Nise genji* (pseuo-genji) is not found among modern braid nomenclature.
39. A method for 12 loops is discussed in "Omani Braiding" by Crocker and Glover, and those for 8 loops in Speiser's *Manual of Braiding,* figs. 14*43(a), 14*44(a), 147, 148. Crocker also mentions the use of 16 loops. In regard to an odd number of the loops and their allotments associated with pseudo-genji process, see *Manual of Braiding,* 146–148.
40. Speiser, *Manual of Braiding,* 129, fig. 14*14, and 170, fig. 16*13. Commonly known as *mitakegumi* in Japan. Also known in the machine-braiding industry as a double soutache (B. Lepperhoff, *Die Flechterei,* 1914).
41. *Niren kakugumi* "paired square braid" is used by Issei Yamaoka in *Shōsōin no Kumihimo,* Shōsōin Jimusho, comp., 10, i.
42. Speiser, *Manual of Braiding,* 147, fig. 14*43(b).
43. See note 10.
44. See note 7.
45. Speiser, *Manual of Braiding,* fig. 14*1(d).
46. Speiser reports in *The Manual of Braiding,* p. 118, the vague childhood recollection of an old man in Japan having seen baleens used in place of straps of twisted paper.
47. See note 10.
48. Personal correspondence, Noémi Speiser, January 1985.
49. Crocker and Glover, "Omani braiding."
50. The loop-manipulation braiding technique was known as *Ashiuchi no himo* (foot-beaten braiding) in the late nineteenth and early twentieth centuries in Japan around the time when it became obsolete. (Suganuma, *Kyō Kumihimo,* 154, 196; Kaoru Yamaki, *Kumihimo no Kenkyū* [Study of Kumihimo] [Tokyo: Sōgō Kagaku Shuppan, 1978], 72.) Other than a braider depicted on a folding screen—*Kumihimo Gotai* (Five Modes of Braiding), painter unknown, ca. 1934?, Adachi Kumihimo Museum, Kyōto-shi—details of the practice at the time are not known.
51. See note 7.
52. See note 23.

Copyright of Textile Museum Journal is the property of Textile Museum and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.